



PC Builder

Imagine how great it would be to have a multimedia PC in your car, complete with GPS, music, DVDs and an internet connection. Well, now you can. Chris Finnamore shows you how to pimp your ride



Q Can you please tell me how I power a PC in my car?

A Car batteries are 12V DC, but conventional PC cases require 230V AC (mains) power. You can buy an inverter, a gadget that plugs into the 12V cigarette lighter and steps the voltage up to 230V AC. But these are quite bulky and you must go for one that supplies a decent level of power – 150W or more. Alternatively, many mini-ITX cases can be run directly from a 12V DC supply. Visit www.mini-itx.com/store/?c=3 to see some examples.

The CarPC case is an even better solution. It is supplied with a lead that connects to your car's wiring loom in the same way as a car stereo, using the red constant 12V feed wire, the black ground wire and the white 12V switched ignition wire. When the ignition is switched on, the white wire carries 12V, which tells the PC to turn on and boot up.

When you turn off the engine, the white wire is no longer live, so the PC begins its shutdown sequence, drawing power from the red 12V wire. If Windows should crash during shutdown, the CarPC has a built-in timer that will cut the power after two hours, saving your car's battery.

Finally, there are two orange wires that you can connect to an external momentary power switch. Like a PC's power switch, a momentary switch temporarily shorts two connections. A momentary connection between the two orange wires will turn the CarPC on or off manually.

Car PC power connector

WIRE	FUNCTION
Red	12v Positive constant feed
Black	Ground
White	Vehicle ignition (12v switched)
Orange	Two wires for external momentary power switch

▲ The car PC connects to your wiring in the same way as a car stereo, allowing you to switch it on with your ignition key

Today's car dashboard includes ever more sophisticated gadgets and entertainment systems, from the humble CD player to all manner of multimedia and navigation devices. While standalone systems from manufacturers such as Alpine can guide you effortlessly to your destination and even play DVD films, they can only do what they were designed to do and nothing more. So how about fitting a PC in your car?

Given the right software and accessories, a PC can do almost anything that a custom-designed bit of electronics can. It's simply the most versatile multimedia system there is. A PC hard disk has enough room for all your music and films. Add a dashboard-mounted touch screen and you have the perfect interface for on-the-move applications, such as satellite navigation. With a wireless networking card you can copy media to your car's PC when parked in the drive, while a Bluetooth dongle and GPRS phone make it possible to surf the internet on the road.

You can buy kits with everything you need to install a PC in your car. We used the CarPC System (£672 inc VAT from www.cartft.com) to turn our Honda into a mobile multimedia centre. The kit consists of an M-II 12000 mini-ITX motherboard in a tough VoomPC case (see review on page 48), complete with a 1.2GHz processor, 40GB hard disk, 512MB of memory and built-in graphics. It also includes a 7" TFT touch-screen display and a power supply that connects to your car's wiring loom.

1 The CarPC System comes ready built and looks like a standard car amplifier, but at the back you can find an array of PS/2, USB2, FireWire and VGA outputs, as well as vacant slots for CompactFlash and CardBus expansion cards.

You will need to install an operating system. As we were planning to install a wireless networking card we used Windows XP Service Pack 2, with its superior wireless networking support.

2 It is far easier to install all the software you need at home rather than after the PC is wired into your car, but turning the PC on is not a simple matter. As the CarPC is designed to run off a car's power system, you will need to plug it into a separate ATX PC power supply to make it work.

Remove the VoomPC's case by unscrewing the six screws at the back and sliding the cover off. At the rear of the mini-ITX motherboard is the PC's power supply. Unplug the 20-pin ATX connector from the board and plug in the connector from your normal ATX power supply. Then plug one of your power supply's Molex plugs into the Molex plug next to the motherboard's ATX connector. Connect a standard keyboard and mouse.

To turn on the PC you need to short pin headers on the motherboard using a screwdriver or jumper. As you look at the motherboard from the front, there is a block of 16 pins on the left-hand side behind the power supply. Short pins three and four on the right-hand side to turn on the PC.

3 Next, you will need an optical drive for the installation. The motherboard has a spare IDE connector for an optical drive, and the driver disc for the motherboard is in the box. Install Windows in the normal way.

Adding wireless networking to synchronise with your home media player or Bluetooth to communicate with your GPRS phone or GPS receiver is easy with a CompactFlash Bluetooth adaptor (£18 including VAT, www.edirectory.co.uk) and CardBus wireless networking card (£30 including VAT, www.dabs.com).

4 It's time to install the software you'll need to manage your media. The CarPC comes with a trial of In Car Terminal, which gives you fast access to a media player and DVD player. We found it fairly clunky and primitive, though, so you might be better off with a media centre application such as CyberLink's Power Cinema. This gives you instant access to your music and films, and its interface has buttons large enough to use with the 7" touch screen provided with the kit.

If you want your CarPC to look like a media centre rather than a Windows PC, create a shortcut to PowerCinema in the Start Menu's Startup folder. PowerCinema will then load as soon as Windows boots. If you want to play DVDs you may have to update the motherboard's graphics drivers. The latest drivers for the VIA graphics chipset are available at www.via.com.tw.

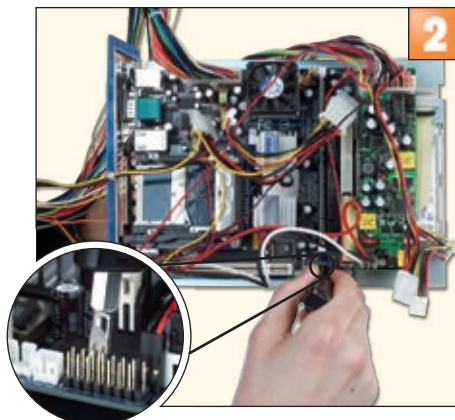
5 To use your CarPC as a GPS navigation device, you will need either a USB or a Bluetooth GPS receiver. The CarPC kit comes with a USB receiver, but as the CarPC will be sitting under your car seat, the Bluetooth option is probably preferable. A Bluetooth receiver costs around £100 and we'll have a Labs test of these next month.

There is a list of PC navigation software on the CarTFT website, and we tested our setup with Microsoft's Autoroute 2006. To enter addresses using the touch screen you will need to use Microsoft's On Screen Keyboard application, which can be found in Start, Programs, Accessories, Accessibility.

6 When you replace the case cover, make sure that none of the loose power leads obstructs the fans on the motherboard,



1



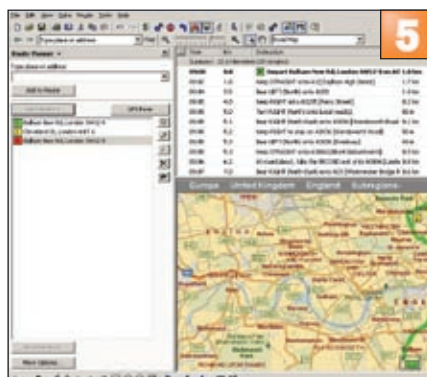
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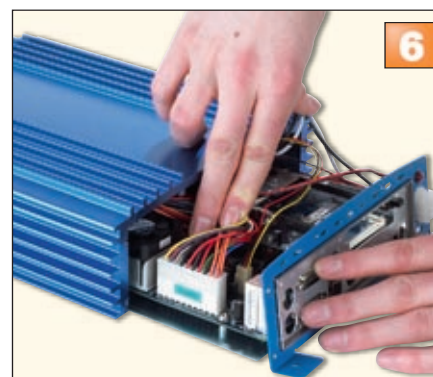
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and don't forget to reconnect the power cable to the fan at the rear of the case.

The PC is powered by the same leads used to power your car's stereo. A breakout lead provided with the kit connects to your stereo's power cables. The PC turns on automatically with your other electrical items as you turn the ignition switch, and shuts down when you turn the key to the off position.

As the PC is connected to your car's permanent power supply, it has an adjustable timer to cut the power should Windows not shut down properly. See the FAQ box on page 264 for more information.

7 You now need to mount the touch-screen display. The screen is supplied with a dashboard mount, but to minimise the number of trailing cables we decided to mount it on the centre console below the heating controls. The display is powered from the cigarette lighter.

8 For a neat installation, and to minimise the risk of theft, it is worth hiding the PC if you can. Depending on your car's design, it may be possible to mount the PC under the passenger seat. This keeps it hidden, and it is easy to run the cables under the carpet to the stereo's wiring under the dashboard.

The PC case has four feet with screw mounting holes to fix it to the car's floor, but you will have to drill holes in the car's underbody. An easier way is to use Velcro pads fixed to the floor with strong contact adhesive to hold the PC in place, and these also make it easier to remove. If the PC won't fit under the car's seat, the passenger foot well or glove box is a good place to mount it, because it's then close to the under-dash wiring.

9 The PC will need to be connected to the car stereo power supply, the touch-screen display and also the stereo itself. Many car stereos have phono inputs, so you can connect the PC's headphone socket to your

stereo using a 3.5mm to phono lead. If your stereo doesn't have auxiliary phono inputs, a cassette adaptor (£5 including VAT from www.maplin.co.uk) will do the job, but less neatly.

Once the PC is properly installed and running, you can use the wireless network to transfer your music and videos to your new car media centre. If you need to install any more software on the CarPC in the future, you can simply connect to the car from your house using Remote Desktop if you have installed Windows XP Professional, or RealVNC (www.realvnc.com) for other versions of Windows. **CS**

NEXT MONTH

BUILD A PENTIUM M PC

Intel's mobile processor is too good to save just for notebooks